

INEL hosts national planning workshop on critical and strategic materials

by Terry Smith, EG&G Idaho

A national planning workshop to determine the role that Department of Energy laboratories will take in critical and strategic materials programs for the Division of Materials Sciences, Office of Basic Energy Sciences was hosted last week by the INEL.

The planning workshop was attended by DOE and other government agency officials, staff members of the Senate Energy and Natural Resources Committee, and representatives of 12 DOE laboratories. The workshop was conducted by Dr. Robert Gottschall, of the DOE Division of Materials Sciences.

According to Gottschall, the study group is identifying ways in which the capabilities and resources already existing at the laboratories can be incorporated into programs for critical and strategic materials national preparedness.

The workshop was especially timely in that it followed the announcement last week by Idaho Senator James McClure of a \$3 million contract from the U.S. Bureau of Mines to the INEL for a multi-year Strategic and Critical Materials Program. This research will focus on production technologies such as biologically assisted minerals processing, metal-gas reactions in thermal plasmas, and extractive metallurgy; and on research areas which support conservation/substitution technologies such as the joining of rapidly solidified alloys (RSA), the joining of ceramics, and non-destructive evaluation of RSA and ceramic materials and joints.

Critical materials are those for which the United States is dependent upon imports from sources of uncertain reliability, and which are considered vital to the nation's security and economy. They include more than 20 metallic elements such as chromium, cobalt, manganese, platinum, tantalum, aluminum, tin and nickel. These materials are used in such applications as stainless steel and other high temperature alloys, electronics, instruments, tools, jet engines, aircraft and missiles.

As reported during the Basic Energy Sciences workshop, many DOE laboratories have existing programs in materials development and analytical techniques that could be readily applied to critical and strategic materials programs. There is extensive work going on in the development of ceramic substitutions, the development of advanced alloys without critical metals such as chromium and cobalt, and surface coatings or treatments to prolong materials life.

Promising research was also reported in the



EG&G IDAHO Chief Scientist John Morfitt explains capabilities of the INEL to a group of materials scientists at an INEL-hosted DOE national planning workshop on critical and strategic materials.

area of ceramic "whiskers" to increase structural hardness; the use of thermal plasmas for materials synthesis, ore reduction and other uses; the use of laser processes for surface modifications; and the use of polymers for surface coatings.

Laboratories represented at the workshop were Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, the INEL, the University of Illinois, Lawrence Berkeley Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Oak Ridge National Laboratory, Pacific Northwest Laboratory, Sandia National Laboratory, and the Solar Energy Research Institute.

EG&G Idaho employees participating in the workshop included Chief Scientist John Morfitt; Robert Chaney, Strategic and Critical Materials Program administrator; Dennis Keiser, manager of the Materials Sciences Division; Harry Brown, who will prepare the final meeting report; John Flinn; P. Vic Kelsey; Lee Richardson; Herschel Smartt; Vic Storhok and Harland Tompkins. Also attending were DOE-ID representatives Charles Gilmore and George Vivian, and Marilyn Osterhout, with ANL-W and soon to take a position on the staff of the Senate Energy and Natural Resources Committee.

PBF fuel damage test set

The Power Burst Facility at the INEL will conduct the second in a series of severe fuel damage experiments during the week of April 18, 1983. These tests are examining nuclear fuel rod damage and fission product behavior during postulated serious nuclear reactor accidents in which the fuel rods would be exposed to extremely high temperatures.

During this second experiment, 32 nuclear fuel rods will be brought quickly to an expected high temperature of almost 4,000 F. (The rods are like those used in commercial power plants and are inside a special test assembly.) When that temperature is reached the reactor will be shut down and the rods allowed to cool slowly.

According to Phil McDonald, EG&G Idaho manager of LWR Fuel Research Branch, the slow cooldown is expected to prevent the break-up of the fuel cladding—the metal surrounding the nuclear fuel pellets; although some melting of the cladding is expected. Researchers believe

this will help preserve the rods in the conditions they were in during the highest temperature.

The severe fuel damage tests will provide a better understanding of the 1979 accident at Three Mile Island. The information will be used to verify computer codes that predict what happens during a severe reactor accident, to help provide improved reactor designs and safety features, and to evaluate emergency response procedures. By showing the nature of potential radioactive releases that could be expected from severe reactor accidents, the test series will provide a better understanding of how the public is protected during possible accidents of this sort.

Representatives of the Nuclear Regulatory Commission, other national laboratories and foreign visitors from countries participating in the NRC severe fuel damage program will be in attendance at the test, now planned for April 21.

Old security passes invalid after May 2

INEL employees who have not obtained their new security passes must do so this month. The old passes will not be valid after May 2, 1983. If you missed the scheduled time for your organization, contact the Security Documentation office (6-2222) to schedule an appointment for a new pass.